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202401UECM3473OE1a

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Started on	Saturday, 17 February 2024, 03:55 PM
Completed on	Saturday, 17 February 2024, 03:55 PM
Time taken	14 secs
Marks	0/8
Grade	**0** out of a maximum of 10 (**0**%)

1
Marks: 1

Let X and Y have joint probability density function(pdf) $f(x,y) = ce^{-4y}$, $0 < x < y < \infty$ and zero otherwise. Find the mean of the conditional distribution of Y|X=2.75. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect
Correct answer: 3

Marks for this submission: 0/1.

2
Marks: 1

Let X_1 and X_2 be independent random variables. X_1 follows a gamma distribution with parameters $\alpha = 2$ and $\beta = 1/7$, whereas X_2 follows an exponential distribution with mean 1/4. Find $E[X_1|X_1+ X_2 = 5]$. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect
Correct answer: 0.66664

Marks for this submission: 0/1.

3
Marks: 1

On an auto collision coverage, there are 3 classes of policyholders, A , B and C. 57% of drivers are in class A, 24% of the drivers are in class B and 19% in class C. The distribution of losses for the drivers are:

Class	Losses		
	1000	5000	10000
	Probability		
A	0.5	0.35	0.15
B	0.47	0.25	0.28
C	0.46	0.3	0.24

A claim is submitted by a randomly selected driver. Calculate the standard deviation of the size of the claim. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect
Correct answer: 3437.954262

Marks for this submission: 0/1.

4

Marks: 1

Given a value of ($\Theta = \theta$), the random variable X follows a Gamma distribution with probability density function

$$f(x) = \theta^2 x e^{-\theta x}.$$

Θ has a uniform distribution on the interval (5, 10). Determine $S_X(0.63)$ for the unconditional distribution. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect

Correct answer: 0.065221

Marks for this submission: 0/1.

5

Marks: 1

Annual claim counts per risk are binomial with parameter m = 3 and Q. Q varies by risk uniformly on (0.32, 0.82). For a risk selected at random, determine the probability of at most one claims. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect

Correct answer: 0.40443

Marks for this submission: 0/1.

6

Marks: 1

You are given:

- Conditional on λ, the random variables $X_1, X_2,...,X_m$, are independent and follow a Poisson distribution with parameter λ.
- $S_m = X_1 + X_2 + ... + X_m$.
- The distribution of Λ is Gamma with parameters $a = 4$ and $\theta = 20$.

Determine the variance of the marginal distribution of S_{113}. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect

Correct answer: 20439440

Marks for this submission: 0/1.

7

Marks: 1

The size of loss ,X has mean 3λ and variance $8\lambda^2$. Λ has the following density function:

$$f(\lambda) = 6(2020)^6/(\lambda+2020)^7.$$

Calculate the variance of the loss. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect

Correct answer: 5467736

Marks for this submission: 0/1.

8

Marks: 1

The annual number of accidents for an individual driver has a Poisson distribution with mean λ. The mean, Λ, of a heterogeneous population of drivers have a gamma distribution with mean 0.88 and variance 0.1936. Calculate the probability that a driver selected at random from the population will have 2 or more accidents in one year. _____

Answer: [   ] ✗

Make comment or override grade

Incorrect

Correct answer: 0.223

Marks for this submission: 0/1.

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